SNOW FLOWERS.

What! flowers! flowers at Christmas-tide; when every aspect of nature repels the idea of their existence; when the earth dons its white vesture that seems a shroud but that is a warm raiment shielding the ground with its embryo fruits from the biting frost; when plants and trees have laid aside their verdant garments, and their nourishing saps
—the blood of their lives— have descended to their earthbound hearts; and when no vestige of floral blossom is to be seen. Flowers, too, whose forms rival in beauty those of the pampered ornaments of the garden; whose hue is pure and spotless as that of the lily.

And yet the botanist knows them not; they do not fall within his category, and he would doubtless disown them as objects of his study. For they are not the offspring of the earth but of the air; their seeds are tiny rain-drops, their nursery is the cold wintry sky. They strew our snowy paths in myriads, we crush them by thousands beneath our feet, and brush them by hundreds from our garments. For our flowers —the flowers of our story— are the beauteous blossoms of the falling snow. — In scientific language they are known as snow crystals but we have preferred a name that more accords with the floral forms they assume. Ever since men's eyes learnt to look for nature's finest handiwork in her smallest creations, these beautiful formations have been the subject of wonder and admiration; they were food for the speculations of Aristotle, Kepler, and Descartes; the Arctic voyagers, seeking for ought to wile away the tedious hours of their protracted winters, found in the observation and delineation of them a charming pastime; and meteorologists have attentively studied their varied forms as a branch of their complicated science.

And yet they are but little known beyond the sphere of "the enlightened few." Although they gently tap at our windows or light on our shoulders, as if to court the admiration they deserve; they nevertheless pass unnoticed, and uncared for; as the desert flowers that are "born to blush unseen." Possibly their modest dimensions

may account for this, for many of the prettiest of them are no larger than that popular standard of magnitude— a pin's head. But this need not be a bar to our acquaintance with them: a magnifying glass, magnifying some half a dozen times, such as well-nigh every household contains, or such as any optician will supply for a shilling or two, is all that is required to familiarise us with these feats of fairy handicraft, and the kaleidoscopic yet ever lovely forms and features they exhibit.

A Bouquet of Snow Blossoms.*

(1)

Furnished with this small instrument, the observation of these snow flowers is simple and easy enough. We have only to walk out when the snow is falling in a cold calm atmosphere — for wind breaks up and destroys the blossoms— and catch the flakes on the coat sleeve, or any other dark substance; and, provided the air and the sleeve be not so worm as to melt them too suddenly, we shall find them composed of aggregations of delicate flowery forms; while single flowers, isolated from the flakes, will ever and anon come pattering down, to charm us for a few moments with their short-lived beauty,

and then to melt and vanish; returning to the element from which they sprang, and leaving no other trace of their existence than a little bead of water. These single efflorescences will best repay our careful scrutiny; to the naked eye they will appear but as little hexagonal or star-shaped particles, from a quarter of an inch downwards in diameter; but under the greater eye of the magnifier, a multitude of structural details of infinite variety and of most delicate tracery will be revealed. Some notion of what may be expected may be gathered from our illustration, which is a random collection of a few of the varieties of form these interesting objects present to our view. Those we have selected are by no means picked specimens; they are only a fair sample of what may be seen during any ordinary fall of snow; thousands more elaborate even than any we have depicted will be found, and, as their variety is next to infinite, seldom will two be found precisely similar. Within the compass and upon the scale of our engraving, we have been unable to show much of the delicate marking to be found on many of them when magnified to a sufficient degree, for the best and only just illustration of their beauties we must refer to nature herself, who has here, as elsewhere, put some of her fairest work into her most insignificant productions.

But, varied as are the details of these ice jewels, there is a striking characteristic uniformity, a sort of prevailing family likeness pervading the whole of them. It will at once be seen that the flowers are all six-pe tailed, and that the petals invariably incline to each other at an angle of sixty degrees; further, that the spiculae, shooting from the petals, and the still smaller shoots from these, all diverge at the same angle; in fact, that every form of detail is hexangular (2). For a long time the cause of this regularity of form remained an enigma, even to scientific minds; it was not till the curious laws of crystallisation came to be studied and known that the key to the mystery was found. The science of crystallography teaches us that when the integrate particles, of which we must suppose every substance is composed, are left free to arrange themselves in their own way, they take up certain definite positions with regard to each other, and build up a mass of the substance according to an order of architecture peculiar to itself; and

it is one of nature's sublime schemes of order that the stones or bricks, so to define these particles, of any one substance shall have a shape exclusively their own, and differing from that of the particles of any other material; and that when they combine or aggregate, they shall produce a pile or heap whose form is similar to or derivable from that of the individual atoms themselves. The resulting piles of particles are crystals, and it is pretty well-known that the crystals of any crystallisable material have a form peculiar to it and to it only. The crystal's form is determined by the shape of its sides or facets, and the angles at which they incline to each other. Water, in solidifying by cold, i. e. in freezing, forms itself into crystals whose facets are hexagons and incline to each other at a constant angle of sixty degrees. The little globule of water, then, that would ordinarily constitute a rain-drop, in falling through an atmosphere of a lower temperature than the freezing point, passes to the solid state, and its particles, piling themselves into their appointed hexangular forms with geometrical precision, produce these exquisite crystalline flowers; thus obeying that supreme order of the universe which ordains that even ice shall put forth its blossoms. But why these blossoms should assume the complicated and varied forms in which we find them; — whether these variations are due to electrical conditions of the atmosphere, or to the chemical constitution of the water from which they are formed, — are questions yet to be solved.

The graceful ice-ferns that ornament our windows in frosty weather are produced, from moisture condensed on the cold glass, by this same regular crystallising process; their sprays and leaves form the same constant angle with each other as the parts of the snow flowers. At the edges of ponds and lakes similar filagree work is to be seen at the commencement of a frost, and before the whole mass of water is consolidated. Hoar frost — frozen dew — presents the same fantastic, though symmetrical arrangement of its spiculse; but nowhere are the phenomena of water crystallisation so attractively manifested as in the pretty objects that have formed the subject of this paper.

We have no desire to invade the territory of a lady's newspaper, or to

usurp its privileges by recommending “patterns for ornamental needlework;” but we think we may, without jeopardising our dignity, or that of our subject, venture to suggest the objects we have been describing for the consideration of our fair friends, as affording excellent designs for their embroidery work. Any amount of variety, with the necessary foundation of uniformity, can be obtained by copying these snow crystals; they may be magnified to any extent without sacrificing an iota of their beauty. A rather quick eye and hand will be required, at first, to catch the details before they thaw away by the radiating warmth of the body; but a little practice will soon make perfect, and their geometrical formation will be found I to greatly facilitate their delineation; besides, it is only necessary to draw one petal of the flower from nature, for as they are all the same in any one flower, they can be repeated the remaining five times at leisure. If we may be permitted to go a step further, we would suggest as the materials to be used in working them, pure white and transparent glass beads upon a black or dark ground of velvet or cloth; the white beads forming the outline and opaque parts, the transparent ones the more icy-looking portions of the crystal. The effect cannot fail to be successful, because so close an imitation of nature can be secured. We hope at some future “Industrial Exhibition” or bazaar to see some “snow crystal” ottomans, or banner-screens, or a pair of “snow-flower” slippers.

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(1) The natural sizes of these bodies are approximately represented by the little figures enclosed in the hexagon in one corner of the cut.

(2) It will be noticed that some of the specimens in our illustration have rounded edges; this is due to a partial thawing of the crystal. We inserted them for variety, although they ere departures from the true formation; they are faded flowers.

J. Carpenter.

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